

Application No.: 09/966557

Case No.: 55871US002

Remarks

This amendment is responsive to the Office Action dated April 21, 2004. Claims 1-26 are currently pending. Reconsideration of the above-referenced application in view of the foregoing amendments and the following remarks is respectfully requested.

Amendments

Claims 1, 18, 21 and 25 have been amended to specify that "the polarizer element and the separate polarization rotator element are integrated to form a single film." The basis for the present amendments can be found throughout the application as filed, for example, at page 9, lines 15-19, page 11, lines 3-6, and page 23, line 16 – page 24, line 7. Thus, no new matter has been added.

§ 103 Rejections

Claims 1-4, 6-12, and 18-26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over European Patent Application Publication No. 0487047 to Shingaki et al. (hereinafter "Shingaki") in view of U.S. Patent No. 5,568,283 to Mitsutake et al. (hereinafter "Mitsutake"). Claims 16 and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shingaki in view of Mitsutake. Claims 5 and 13-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shingaki in view of Mitsutake and further in view of U.S. Patent No. 5,986,730 to Hansen et al. (hereinafter "Hansen"). The Applicants hereby traverse these rejections and respectfully submit that all currently pending claims are patentably distinguishable over Shingaki, Mitsutake and Hansen.

Applicants respectfully submit that none of the cited references, alone or in combination, disclose all elements of any of the claims of the present application. For example, none of the cited references teach or suggest a film that includes a polarizer element and a separate polarization rotator element that are integrated to form a single film as required by the amended claims. As explained in the specification of the present application, such films present various advantages not found in optical devices where a polarizer element and a polarization rotator element are not integrated to form a single film. For example, the films according to the present invention can allow cost savings by eliminating yield losses due to cutting sheet polarizers at an angle, which

Application No.: 09/966557

Case No.: 55871US002

would otherwise be the case for polarizers used in some LCDs. (See Specification, at p. 8, lines 1-12 and 22-25, and at p. 9, lines 5-13). In addition, some films according to the present invention can have further advantages of reduced thickness and a pre-aligned orientation between the polarizer element and the polarization rotator element. (Specification, p. 9, lines 15-19). Furthermore, the films of the present invention can be installed into an LCD as a single component, thus allowing more convenient assembly.

In the April 21, 2004 Office Action, the Examiner has acknowledged that Shingaki does not contain "an explicit teaching wherein said invention is a film." The Office Action references Figure 1 of Shingaki and asserts that this figure illustrates a polarizing element (reference numeral 1) and a separate polarization rotator element (reference numeral 5). The Applicants respectfully submit that Shingaki neither teaches nor suggests, explicitly or inherently, making a single film containing a polarizing element and a polarization rotator element. On the contrary, Shingaki teaches a free-standing pair of base boards with an FLC layer provided therebetween interposed between the polarizer (1) and the halfwave plate (5). Furthermore, Shingaki teaches that the halfwave plate (5) is physically rotatable depending on the temperature of the FLC layer, which would be impracticable where the polarizer and the polarization rotator are integrated to form a single film. Thus, integrating the polarizer (1) and the halfwave plate (5) would defeat the purpose of the invention of Shingaki by immobilizing the halfwave plate (5). The Applicants also believe that Shingaki is consistent with the Background section of the Applicants' patent application, which explains that traditionally, polarizer elements and polarization rotator elements are manufactured in ways that do not facilitate their production as a single film. Typically, each of these elements is separately incorporated in the final display construction, consistent with Shingaki.

The Examiner then turns to Mitsutake stating that it discloses a "filmic apparatus and, by extension, a method of polarizing light" and referencing Figures 3, 5, and 6. The Applicants respectfully submit that Mitsutake also neither teaches nor suggests, explicitly or inherently, forming a single film including a polarizer element and a polarization rotator element. In particular, the Applicants respectfully submit that the devices of Figures 3, 5, and 6 of Mitsutake are not films, but "optical modulation devices." (See, e.g., Mitsutake, col. 3, lines 47, 48 and 52-54). Although some of the individual components of the illustrated devices can be characterized as films, each of the optical modulation devices shown and described includes two transparent glass

Application No.: 09/966557

Case No.: 55871US002

substrates (reference numerals 301 and 311). Thus, a person of ordinary skill in the art would not consider any of the devices illustrated in Figures 3, 5, and 6 of Mitsutake to be "a single film". The presence of the glass substrates is inconsistent with the general properties typically understood to accompany films. Because none of the references teach or suggest a single film having both a polarizer element and a polarization rotator element, as required by all claims of the present application, the Applicants submit that claims 1-26 are patentable over the cited references and respectfully request withdrawal of the rejections.

The Applicants also respectfully submit that, as the Examiner knows, according to MPEP §2143:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The Applicants believe that neither the cited references nor knowledge generally available to one of ordinary skill in the art would provide a suggestion or motivation to combine the cited references to arrive at the Applicants' invention with a reasonable expectation of success. On the contrary, even if the devices shown in Figures 3, 5 and 6 of Mitsutake were considered to be "films," the disclosure of Shingaki would teach away from combining it with Mitsutake, as the devices disclosed Shingaki include a free-standing pair of base boards with an FLC layer sandwiched therebetween interposed between the polarizer (1) and the rotatable halfwave plate (5). As explained above, attaching the polarizer (1) to the halfwave plate (5) would defeat the purpose of the invention of Shingaki, which involves physically rotating the halfwave plate in correlation with the temperature variations in the FLC layer. Thus, one of ordinary skill in the art would not be motivated to combine the disclosures of Shingaki and Mitsutake.

Moreover, the dependent claims currently pending include other patentable elements. For example, claims 2-5 and 26 recite that the film includes a second polarizer element. The Office Action asserts that Shingaki illustrates two polarizers and a half-wave retarder. There is,

Application No.: 09/966557

Case No.: 55871US002

however, no teaching or suggestion in the references regarding the formation of two polarizer elements and a polarization rotator element into a single film.

Claim 8 recites that the surface of the polarizer element facilitates alignment of the polarization rotator element (e.g., the polarizer element acts as an alignment layer for the polarization rotator element). Such an arrangement requires that the polarizer element and polarization rotator element be in contact. This is not taught or suggested in Shingaki.

Claims 10 and 11 recite that the polarization rotator element comprises a light absorbing material that is different from the liquid crystal material of the element (claim 10) and the light absorbing material is aligned within the polarization rotator element to substantially absorb light having a first polarization and to substantially transmit light having a second polarization orthogonal to the first polarization. None of the cited references teach or suggest polarization rotator elements containing such light absorbing material.

Claim 12 recites that the polarization rotator element comprises a light diffusing material that is different from the liquid crystal material of the element. None of the cited references teach or suggest polarization rotator elements containing such light diffusing material.

Claims 18-20 recite a polarizer element that preferentially transmits a substantial portion of light having a first circular polarization. None of the cited references teach or suggest such a polarizer element. All of the cited references appear to use linear polarizers. The Office Action refers to the FLC molecule layer of Shingaki. However, Shingaki teaches specifically linearly polarized light and the rotation of that linear polarization to a different linear orientation, while there is no discussion regarding circularly polarized light. Moreover, there is no indication that the FLC molecule layer acts as a polarizer. In fact, Shingaki teaches placing polarizers on either side of the FLC molecule layer.

Claims 22-24 recite a separate polarizer disposed between the film (which has a polarizer element and a polarization rotator element) and a liquid crystal cell. The Applicants respectfully submit that none of the device constructions shown in the references illustrate the recited structure, which includes a) light source, b) film comprising a polarizing element and a separate polarization rotator element, c) a polarizer, and d) a liquid crystal cell as recited in claims 22-24.

Therefore, for at least the foregoing reasons, the Applicants submit that the present claims 1-26 are patentable over the cited references and an action acknowledging the same is

Application No.: 09/966557Case No.: 55871US002

respectfully requested. In view of the above, it is submitted that the application is in condition for allowance, which action is earnestly solicited. If after reviewing this amendment and response, should the Examiner have questions or require additional information, the Examiner is cordially invited to call the undersigned attorney.

Respectfully submitted,

February 10, 2005
Date

By: 

Anna A. Kobilansky, Reg. No.: 53,146
Telephone No.: (651) 737-8345

Office of Intellectual Property Counsel
3M Innovative Properties Company
Facsimile No.: 651-736-3833